

**Shri G.S. Institute of Technology & Science, Indore**  
**Dept. of Electronics & Telecommunication Engineering**  
**B.Tech. II Year [Session: July – Dec 2024]**  
**EC25XXX: SIGNALS AND SYSTEMS**

**LECTURE PLAN**

<b>Lecture No.</b>	<b>Topic / Sub Topic planned to teach</b>	<b>Remarks</b>
1.	Introduction and overview of syllabus	
2.	<b>Unit-1:</b> Types of signals- Continuous-time, discrete-time, Energy & Power signals with examples	
3.	Even-odd, Periodic-Aperiodic, exponential signals with examples	
4.	Sinusoidal sequences with examples	
5.	Discrete-time sequences and its types, operations on sequences	
6.	Operations on sequences with examples	
7.	Discrete Time Systems and its types- causal and memoryless systems with examples	
8.	Time-invariant systems, Invertibility and inverse systems with examples	
9.	Linear-non linear & stable systems with example	
10.	<b>Unit-2:</b> LTI systems & its properties	
11.	Convolution sum formulae derivation	
12.	Convolution Integral & examples on convolution	
13.	Examples on convolution	
14.	Impulse Response and step response of LTI systems	
15.	System Representation through LCCDE	
16.	<b>Unit-3:</b> Continuous-time Fourier series (CTFS) and its types	
17.	Properties of Fourier series and examples	
18.	Examples of Fourier series: Exponential & Trigonometric FS	
19.	Fourier Transform and its derivation from FS	
20.	Properties of continuous-time Fourier Transform with proof	
21.	Fourier Transform of basic signals	
22.	More examples on Fourier Transform	
23.	Application of Fourier analysis in comm. System, Parseval's Theorem	
24.	<b>Unit-4:</b> Laplace Transform (LT), Relationship between LT & FT, ROC	
25.	Region-of-Convergence (ROC) explanation, Properties of ROC, pole-zero concept	

26.	Laplace Transform of Basic signals, examples with ROC	
27.	Properties of Laplace Transform with examples	
28.	Inverse Laplace Transform and its methods	
29.	Examples on ILT, examples based on ROC	
30.	Analysis & characterization of LTI system using LT	
31.	Types of LT- Unilateral & Bilateral, their relation, Properties of ULT	
32.	Solving second-order difference equation using ULT	
33.	z-Transform & its properties with proof	
34.	Region-of-Convergence (ROC), Properties of ROC, Unit-circle stability	
35.	Basic examples, examples based of properties of zT	
36.	Inverse z-Transform methods with examples	
37.	characterization of LTI system using zT and unilateral zT	
38.	Causality and stability of LTI system, solving difference equation using UzT	
39.	<b>Unit-5:</b> Sampling basics, proof of sampling theorem	
40.	Reconstruction of signals from samples, aliasing phenomenon, types of sampling	
41.	Application of signals and systems in comm. system	
42.	Discrete-time processing of continuous-time signals	
43.	DTFT & examples	